Haemoproteus spp. Infection of Domestic Poultry of Bangladesh

Ausraful Islam2,3*, Anisuzzaman4, Abul Kalam Mohammad Arifur Rabbi, Asadur Rahman1,2,3, Md. Atiqul Islam2,3 and Md. Hafezur Rahman

Haemoproteus sp. can infect a variety of avian species including domestic poultry. An exploratory study was conducted from January, 2006 to December, 2006 in different areas of Netrokona and Mymensingh district to determine the presence of Haemoproteus spp. in different types of birds. Blood samples were collected from the veins of 57 pigeons (Columba livia), 30 chickens (Gallus gallus domesticus), 50 ducks (Anas platyrhynchos domestica) and 32 quails (Coturnix japonica) and smears were prepared. Of all the examined birds, 23.3% (7/30) chickens, 50.9% (29/57) pigeon and 12.5% (4/32) quails were found to be infected with Haemoproteus spp. All the ducks were tested negative for Haemoproteus spp. Highest presence of Haemoproteus spp. was observed among older bird in case of both chicken (13.33%) and pigeon (33.33%). In case of chickens, 20% (14/30) male were infected with Haemoproteus spp. while in female it was only 3.33% (16/30). Out of 57 pigeon 31.58% female and 19.3% male were tested positive for Haemoproteus spp. infection. Present study shows that this protozoan parasite is capable of infecting several species of domestic poultry. Further study needs to be conducted to list different species of this parasite and determine the economic losses due to the parasitic infection along with control strategies.

KEYWORDS
Haemoproteus, chicken, duck, pigeon, quail.

INTRODUCTION
The genus Haemoproteus includes a large number of intracellular protozoan parasites of birds distributed all over the world (1). It is the most common blood parasite of birds and has been reported from 67% of total bird species (2). This parasite is transmitted by blood sucking insects like mosquitoes, biting midges (Culicoides), louse flies (Hippoboscidae) and tabanid flies (Tabanidae) (3). Asexual development of this parasite occurs in the peripheral blood of the birds and sexual development in the vector louse fly (4). The pathogenicity of this parasite can vary depending upon the species of the parasite from altered physiology up to mortality (5-7).

Haemoproteus columbae widely occurs in pigeon in tropical and subtropical regions. It is usually non-pathogenic and only causes disease when the pigeons are stressed.

H. lophortyx infection in captive bobwhite quail has been reported from California, USA (8). From Asia 4.5% prevalence of Haemoproteus spp. among poultry has been reported (9). Meager information is available presence of avian hemoproteozoa in Bangladesh which includes reports on different parasites of pigeon including H. columbae (10) and Leucocytozoon spp. among ducks (11). The present study was designed to explore the presence of Haemoproteus spp. among different types of poultry birds of Bangladesh.

Department of Parasitology,
1Department of Pathology, Faculty of Veterinary Science, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh
2Center for Communicable Diseases, ICDDR,b, Mohakhali, Dhaka-1212
3Laboratory of Parasitic Diseases, National Institute of Animal Health, National Agricultural and Food Research Organization, 3-1-5 Kannondai, Tsukuba, Ibaraki 305-0856, Japan.
MATERIAL AND METHODS
To study the presence of Haemoproteus spp., 57 pigeons (Columba livia), 30 chickens (Gallus gallus domesticus), 50 ducks (Anas platyrhynchos domestica) and 32 quails (Coturnix japonica) were examined from different areas of Mymensingh and Netrokona district from January, 2006 to December, 2006. Chickens and pigeons were sampled from the same house hold. To observe the age related presence of Haemoproteus spp., all the three species were grouped as 1-6 month, 6-12 month and more than 12 month age group. Blood samples were collected from the wing vein of the birds. Thin smear was prepared, made air dried and stained with Giemsa’s stain. Then the slides were examined under microscope for the detection of the protozoa using immersion oil objective. Statistical analysis was performed using the software SPSS (Statistical Package for Social Science 11.5).

RESULTS
Of all the examined birds, 23.3% (7/30) chickens, 50.9% (29/57) pigeon and 12.5% (4/32) quails were found to be infected with Haemoproteus spp. (Fig. 1). All the ducks were tested negative for Haemoproteus spp. (Fig. 1). All the ducks were tested negative for Haemoproteus spp. (Fig. 1). Of the 30 chicken 12 were under 1-6 month age group, 8 were under 6-12 month age group and 10 were under more than 12 month age group (Table 1). In case of chicken, highest presence of Haemoproteus spp. was observed in the 6-12 month age group (13.33%) followed by the 1-6 month age group. Chickens of more than 12 months age group were found to be free from this parasite. Of the 30 chicken, 20% (14/30) male were infected with Haemoproteus spp. while in female it was only 3.33% (16/30) (Table 2). On the other hand, out of 57 pigeon 28 were male and 29 were female and highest presence was recorded in female (31.58%) in comparison to male (19.3%). These reports corroborate the earlier findings of (19). In case of quail though the number of male and female was equal but the highest presence was observed in female (9.38%) in comparison to male (3.13%).

DISCUSSION
In pigeons the highest presence was observed in the more than 12 months age group (33.33%) followed by 6-12 month age group (22.80%) in the 1-6 month age group (3.51%). Similar finding was observed by Msolle et al (2010) who found H. columbae more significantly prevalent in adult (63%) than in nestlings (11%) (18).

In case of chicken, highest presence of Haemoproteus spp. was observed in the 6-12 month age group (13.33%) followed by the 1-6 month age group. Chickens of more than 12 months age group were found to be free from this parasite. Of the 30 chicken, 20% (14/30) male were infected with Haemoproteus spp. while in female it was only 3.33% (16/30) (Table 2). On the other hand, out of 57 pigeon 28 were male and 29 were female and highest presence was recorded in female (31.58%) in comparison to male (19.3%). These reports corroborate the earlier findings of (19). In case of quail though the number of male and female was equal but the highest presence was observed in female (9.38%) in comparison to male (3.13%).

There is evidence that the vector (Culicoides spp) is capable to feed on chickens and turkey (12-14). Pseudolynchia canariensis flies lack strong host specificity (15) with a very wide host range that includes 33 genera, 13 families and 8 orders of birds. So it can be assumed that infected P. canariensis flies might transmit the infection among the chicken. H. columbae occurs in pigeon associated with human settlements throughout the world (16). The overall presence of H. columbae has been recorded in pigeon as 47.05% (17). Recurring outbreaks of H. lophortyx infection in captive bobwhite quail with well identified clinical signs and mortality has been reported from California, USA (8). But in present study all the quails sampled was apparently healthy.

The finding of present study could not be thoroughly compared and discussed due to paucity of the literature available on the subject. Thorough study with diversified parameters on the subject is needed. Identification of different species of this blood protozoon among the domestic and wild birds of Bangladesh not only will generate knowledge but also help in developing strategies for successful control programs.
REFERENCES

*Address for correspondence:*
M Ausraful Islam, Research Investigator, Center for Communicable Diseases, icddr,b, GPO Box 128, Dhaka 1000, Bangladesh
68, Shaheed Tajuddin Ahmed Sarani, Mohakhali, Dhaka-1212, Bangladesh
e-mail address: rajibdvmpara@gmail.com
TABLES

Table 1: Age related presence of Haemoproteus spp. in different species

<table>
<thead>
<tr>
<th>Species</th>
<th>Age</th>
<th>Birds examined</th>
<th>Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicken</td>
<td>1-6 m</td>
<td>12</td>
<td>3 (10%)</td>
</tr>
<tr>
<td></td>
<td>6-12</td>
<td>8</td>
<td>4 (13.33%)</td>
</tr>
<tr>
<td></td>
<td>more than12 months</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Pigeon</td>
<td>1-6 m</td>
<td>14</td>
<td>2 (3.51%)</td>
</tr>
<tr>
<td></td>
<td>6-12</td>
<td>24</td>
<td>13 (22.80%)</td>
</tr>
<tr>
<td></td>
<td>more than12 months</td>
<td>19</td>
<td>14 (33.33%)</td>
</tr>
<tr>
<td>Quail</td>
<td>1-6 m</td>
<td>32</td>
<td>4 (12.5%)</td>
</tr>
</tbody>
</table>

FIGURES

Figure 1: Malaria parasites (*H. columbae*) in the gametocyte stage in pigeon blood.